

REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested.

Claims 1-22 are now in this case. No claims have been cancelled. Claims 5, 6, 8-10 and 12-16 have been withdrawn from consideration by the examiner, as being directed to a non-elected species. Claims 1, 4, 7, 11 and 17-22 have been amended. No new matter has been added.

Claims 1-4, 7, 11, 19 and 22 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Tsang et al. The patent examiner stated that: "Tsang discloses that suitable binders include epoxy resins and phenolic resins."

Tsang et al. discloses a method of manufacturing a friction article. The method involves a metal foam and a filler, a friction modifier and a reinforcing fiber carried in a liquid binder were drawn into the pores of the open foam structure until a desired density was obtained, Col. 1, lines 53-59. This invention is overcoming a problem in the prior art of the use of the reinforcing fiber "asbestos."

Claims 1 and 22 as amended recite:

1. (Twice Amended) An acoustically damping composite article, consisting essentially of a non-elastomeric polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymer matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof.
22. (Amended) A method of forming a composite consisting essentially of the step of: impregnating a metal foam, said metal foam having an open cell structure, with a resin component so as to completely penetrate said open cell structure of said foam and fill the

open cells of said metal foam with said resin component; and
converting said resin component, within said cells, to a bulk solid, non-elastomeric polymerized resin, thus forming a composite comprising a matrix of said non-elastomeric polymerized resin, said matrix having therein said metal foam.

The Federal Circuit in Constant v. Advanced Micro-Devices Inc., 7 U.S.P.Q.2d 1057, 1064 (Fed. Cir. 1988) stated: "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Thus, Tsang et al. does not anticipate claims 1 and 22. There is no disclosure in Tsang et al. with regard to the metal foam being impregnated with said polymer matrix so as to completely penetrate and fill the cells thereof as recited in claims 1 and 22. Claims 1 and 22 do not recite to fillers nor friction modifiers nor reinforcing fiber as is required in Tsang et al.

Claims 2-4, 7, 19 depend from and contain all the limitations of claim 1, it is felt that claims 2-4, 7, 19 distinguish from the reference in the same manner as amended claim 1.

Claims 1-4, 7, 19 and 22 have been rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Reitz. "Reitz discloses the claimed invention except for literally disclosing that the metal foam is an open celled foam. It appears that the foam must inherently be an open cell foam because the pores of the foam are filled with impregnate, Col. 9, lines 67 to Col. 10, line 11. Reitz also discloses a hardened silicon rubber, which reads on the applicants' definition of a non-elastomeric polymer matrix."

Reitz relates to an acoustic energy absorbing baffle. Housing sheet 61 is a porous metal foam, e.g., aluminum-nickel, impregnated with rubber. It is formed by dipping the metal foam into uncured rubber and then curing the rubber. It is stated at Col. 10, lines 3-4 that: "It is not, in this present embodiment an acoustically absorptive material such as the RTV silicon rubber as taught in U.S. Patent No. 4,528,652."

It is stated at Col. 10, lines 8-9 that: "It [sheet 61] merely serves as an acoustic window for frequencies of acoustic energy (underwater) of 29 kHz and below." This would appear to mean that frequencies of acoustic energy of 29 kHz and below pass through.

It is stated at Col. 10, line 12 that: "Care must be taken to ensure that sheet 61 is watertight." This would appear to mean that it is an elastomer and not "non-elastomer polymer."

Claim 1 has been amended to recite:

(Twice Amended) An acoustically damping composite article, consisting essentially of a non-elastomeric polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymer matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof.

Claim 22 has been amended to recite:

(Amended) A method of forming a composite consisting essentially of the step of: impregnating a metal foam, said metal foam having an open cell structure, with a resin component so as to completely penetrate said open cell structure of said foam and fill the open cells of said metal foam with said resin component; and converting said resin component, within said cells, to a bulk solid, non-elastomeric polymerized resin, thus forming a composite comprising a matrix of said non-elastomeric polymerized resin, said matrix having therein said metal foam.

Claims 1 and 22 as amended require that the composition is "acoustically damping" and that the polymer is "non-elastomeric polymer."

The Federal Circuit in Constant v. Advanced Micro-Devices Inc., 7 U.S.P.Q.2d 1057, 1064 (Fed. Cir. 1988) stated: "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Thus, Reitz does not anticipate claims 1 and 22. There is not suggestion, or motivation or

teaching in Reitz for use of his invention in the present invention and the problems that it solves with regard to absorbing sound.

Claims 2-4, 7 and 19 depend from claim 1 and contain all the limitations of claim 1 as amended, claims 1-4, 7 and 19 are felt to distinguish from the reference in the same manner as amended claim 1.

Claims 17, 18, 20 and 21 are rejected under 35 U.S.C. §a 103(a) as being unpatentable over either Tsang or Reitz. The patent examiner stated that:

With regard to claim 21, none of Fisher, Tsang and Reitz specifically disclose the pore size relationship of the pores of the metal foam. It would have been obvious to one having skill in the art at the time the invention was made to have optimized either the thickness of the metal foam to average cell diameter of the metal foam, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Fisher relates to the fabrication of shoes and pads for horses. A wire is kinked and then cut into small lengths, e.g., 2.5 cm, to form fibers. These kinked wire fibers are formed into a shape for the horseshoe or pad and by means of a series of rollers then formed into a sheet having a density. The fiber metal structure has voids which are filled with a plastic material, Col. 2, line 56 to Col. 3, line 26. The metal itself is not porous and clearly does not have open cells. "Porous" refers to voids between the individual fiber metal wires.

Tsang et al. discloses a method of manufacturing a friction article. The method involves a metal foam and a filler, a friction modifier and a reinforcing fiber carried in a liquid binder were drawn into the pores of the open foam structure until a desired density was obtained, Col. 1, lines 53-59. There is no disclosure within in this reference with regard to the thickness of the metal foam or to the diameter of the pores/cells. This invention is overcoming a problem in the

prior art of the use of the reinforcing fiber "asbestos."

Reitz discloses an acoustic energy absorbing material and an elastomer.

Reitz relates to an acoustic energy absorbing baffle. Housing sheet 61 is a porous metal foam, e.g., aluminum-nickel, impregnated with rubber. It is formed by dipping the metal foam into uncured rubber and then curing the rubber. It is stated at Col. 10, lines 3-4 that: "It is not, in this present embodiment and acoustically absorptive material such as the RTV silicon rubber as taught in U.S. Patent No. 4,528,652."

It is stated at Col. 10, lines 8-9 that: "It [sheet 61] merely serves as an acoustic window for frequencies of acoustic energy (underwater) of 29 kHz and below." This would appear to mean that frequencies of acoustic energy of 29 kHz and below pass through.

It is stated at Col. 10, line 12 that: "Care must be taken to ensure that sheet 61 is watertight."

Independent claim 21 has been amended to recite:

21. (Three Times Amended) An acoustically damping composite article, consisting essentially of a polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymeric matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof, and said metal foam thickness no less than 3 times the average diameter of said cells.

There is no suggestion or teaching with regard to the thickness of the metal foam in any of the cited references. There is no suggestion, teaching or motivation in any of these references to combine these references and there is no relationship between the cited references and the problem being solved in the present application.

The patent examiner cited In re Aller, 105 U.S.P.Q. 233, 235 (CCPA 1955). This reference has no pertinence with regard to the claims in this patent application. In re Aller relates

to a patent application in which the issue related to the patentability of claims in which both the temperature and concentration were changed, i.e., the prior art disclosed a temperature and concentration and the claims in issue changed the ranges. There are no prior conditions disclosed in the cited references so that patentability of amended claim 21 does not involve a change of conditions. In addition, none of these cited references is in the field of the applicants' endeavor or reasonably pertinent to the particular problem with which the inventors were concerned, see In re Oetiker, 24 U.S.P.Q.2d 1443, 1445 (Fed. Cir. 1992).

The test of Section 103 is not whether an improvement or a use set forth in a patent would have been obvious or nonobvious; rather the test is whether the claimed invention, considered as a whole, would have been obvious, Jones v. Hardy, 220 U.S.P.Q. 1021, 1024 (Fed. Cir. 1984). The Federal Circuit in Jones stated:

Though it is proper to note the differences in a claimed invention from the prior art, because that difference may serve as one element in determining the obviousness/nonobviousness issue, it is improper (even if erroneously suggested by a party) to consider the difference as the invention. The "difference" may have seemed slight (as has often been the case with some of history's great inventions, e.g., the telephone), but it may also have been the key to success and advancement in the art resulting from the invention. Further, it is irrelevant in determining obviousness that all or all other aspects of the claim may have been well known in the art. Hence the statute, the law established not judges but by Congress, requires that the invention as claimed be considered "as a whole" when considering whether that invention would have been obvious when it was made. Id. at 1024.

Thus, it is impermissible to focus on the "gist" or "core" of the invention, Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 230 U.S.P.Q. 416, 420 (Fed. Cir. 1986), or on

specific differences between the claimed invention and prior art, Jones, at 220 U.S.P.Q. at 1024. Moreover, the invention as a whole is not restricted to the specific subject matter claimed, but also embraces its properties of that structure and the problems which it solves. In re Wright, 6 U.S.P.Q.2d, 1959, 1961 (Fed. Cir. 1988).

Similarly, the references must be taken in their entirety, including those portions which argue against obviousness, Bausch & Lomb, 230 U.S.P.Q. at 420. "It is impermissible within the framework of Section 103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to a full appreciation of what such reference fairly suggests to one skilled in the art." Id. at 419. The courts have long cautioned that consideration must be given "where the references diverge and teach away from the claimed invention." Akzo N.V. v. International Trade Commission, 1 U.S.P.Q.2d 1241, 1246 (Fed. Cir. 1986).

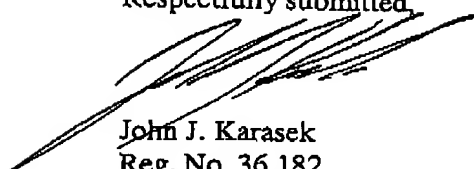
Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Kindly charge any additional fees due, or credit any overpayment of fees to Deposit Account 50-0281.

In view of the foregoing, it is submitted that this application is now in condition for

allowance.

Respectfully submitted,


John J. Karasek
Reg. No. 36,182
Phone No. 202-404-1552

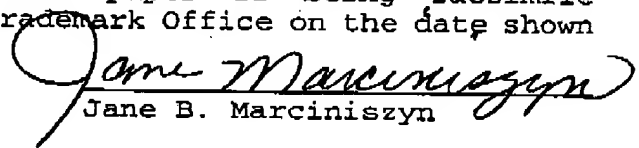
Prepared by:
Jane Barrow Marciniszyn
Reg. No. 34,217
Phone No. 202-404-1551

Associate Counsel
(Patents)
Naval Research Laboratory
4555 Overlook Avenue, SW.
Washington, D.C. 20375-5325

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2-16-01
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Jane B. Marciniszyn

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

1. (Twice Amended) An acoustically damping composite article, ~~comprising~~ consisting essentially of a non-elastomeric polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymer matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof.
21. (Three Times Amended) An acoustically damping composite article, ~~comprising~~ consisting essentially of a polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymeric matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof, and said metal foam thickness no less than 3 times the average diameter of said cells.
22. (Amended) A method of forming a composite ~~comprising~~ consisting essentially of the step of:

impregnating a metal foam, said metal foam having an open cell structure, with a resin component so as to completely penetrate said open cell structure of said foam and fill the open cells of said metal foam with said resin component; and

converting said resin component, within said cells, to a bulk solid, non-elastomeric polymerized resin, thus forming a composite comprising a matrix of said non-elastomeric polymerized resin, said matrix having therein said metal foam.